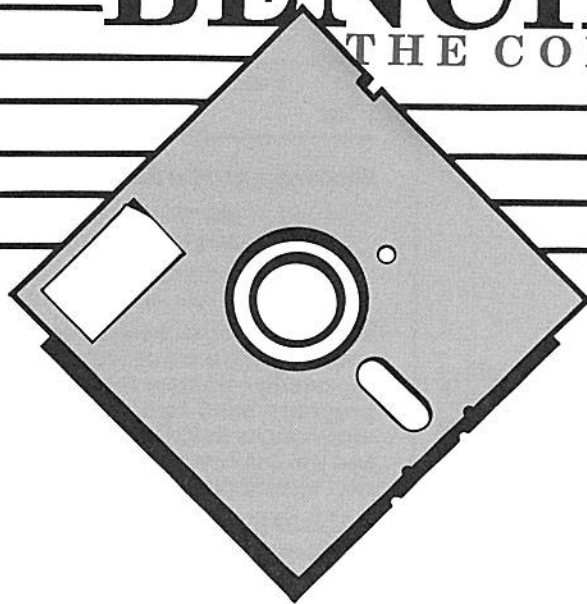


BENCHMARKS

THE COMPUTING CENTER



University of North Texas
VOLUME 9 NUMBER 6
NOVEMBER 1988

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SERVICES AVAILABLE TO USERS OF THE UNT COMPUTING FACILITIES

The UNT Computing Center is located in the Information Sciences Building (ISB), Room 119. Phone Numbers:

Computing Center: (817) 565-2324
Help Desk: (817) 565-4050
Graphics Lab: (817) 565-3479
ISB I/O Area: (817) 565-3890
BA I/O Area: (817) 565-2350

All personnel listed below can be contacted either by calling the Computing Center or by sending them electronic mail on MUSIC/SP (ID-codes follow each name. All IDs are on BITNET node UNTMUSIC).

BENCHMARKS - Claudia Lynch (AS04)

Information & ID-Codes; Disk Space Problems - Marilyn Jett

Statistical/Research Support - George Morrow (AS01), Panu Sittiwong (AC09), Phanit Laosirirat (AC44)

Academic ADABAS/COM-PILETE - Janis Burkham (AC55)

CRSP & COMPUSTAT Problems - Panu Sittiwong (AC09), Phanit Laosirirat (AC44)

Student Programming Problems - CSC Dept., GAB Room 542A; BCIS Dept., BA Room 152

Problems with JCL, Passwords, or Operating Systems; or Communication/Terminal Problems - Help Desk

Data Entry; Test Scoring & Analysis - Betty Grise

Administrative Applications - Coy Hoggard

Printout Retrieval - ISB or BA I/O Operators



DIALING-UP UNT COMPUTERS OVER THE TELEPHONE

Phone numbers for the Local Area Network (LAN) are:

300/1200 BAUD: (817) 565-3300, (817) 565-3499
2400/9600 BAUD (817) 565-3461

2400/9600 BAUD: D/FW METRO 429-6006, 429-9314
Area code 214 must dial 817 before the METRO number.

The numbers that accommodate multiple baud rates have an autobaud feature that requires you to hit the <RETURN> key repeatedly so that the receiving modem can determine the appropriate baud rate. When you have established a communications link, the # prompt will appear on your screen and you can enter one of following CALL commands to connect with the computer of your choice.

CALL 8040 connects with the NAS/8083 (supports line editing or PCWS). Operating environments available are: MUSIC/SP, VM/CMS.

CALL 3270 connects with the NAS/8083 through a 3270 protocol converter (supports full-screen editing). Operating environments available are: MUSIC/SP, VM/CMS, ADABAS/COM-PILETE, PHOENIX

CALL DEC connects with the VAXcluster (VMS, Eunice)

CALL 780 connects with the Research VAX (Unix)

CALL 3000 connects with the Libraries' HP-3000 (Bibliographic data base).

CALL 6800 connects with the NBI (Unix)

Communications Settings			
LAN addresses	Data Bits	Parity	Stop Bits
DEC, 3000	8	N	1
8040, 3270, 780, 6800	7	E	1

HOURS FOR UNIVERSITY OF NORTH TEXAS COMPUTER ACCESS AREAS : FALL 1988*

Location	Times	Days
Computing Center RJE	Noon-Midnight 7 a.m.-Midnight 7 a.m., Tuesday-Midnight, Saturday (Open 24 hours/day)	Sunday Monday Tuesday-Saturday
ISB 110 Terminal Area	2-10 p.m. 7:30 a.m.-Midnight 7:30 a.m.-6 p.m. 9 a.m.-6 p.m.	Sunday Monday-Thursday Friday Saturday
College of Business	Noon-11:45 p.m. 8:15 a.m.-11:45 p.m. 8:15 a.m.-7:45 p.m.	Saturday, Sunday Monday-Thursday Friday
GAB 550C	2 p.m.-Midnight 8 a.m.-Midnight 8 a.m.-5 p.m. 2 p.m.-8 p.m.	Sunday Monday-Thursday Friday Saturday
Graphics Lab	Noon-10 p.m. 8 a.m.-11 p.m. 8 a.m.-6 p.m. Noon-5 p.m.	Sunday Monday-Thursday Friday Saturday

*Hours may vary. Check MUSIC/VAX News and/or posted schedules for exceptions.

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GENERAL INFORMATION

Virus Attacks ARPA Internet – UNT Uninfected

By Billy Barron, VAX System Manager (Billy@UNTVAX) and Claudia Lynch, Benchmarks Editor (AS04@UNTVM1)

A computer virus infested Unix machines on the TCP/IP Internet (ARPANET, NSFNET, MILNET, CSNET, etc) during the first week of November. Some 6000 nodes including the University of California Berkley, Lawrence Livermore, Stanford, NASA, the University of Arizona, and the University of Houston were infected. The virus worked by taking advantage of bugs in the Unix operating system. It entered computer systems through Unix mail, TELNET (remote login), FTP (file transfer), or some other network utilities. Once in a computer system, the virus found all other computer systems that the machine knew about and then attacked those systems.

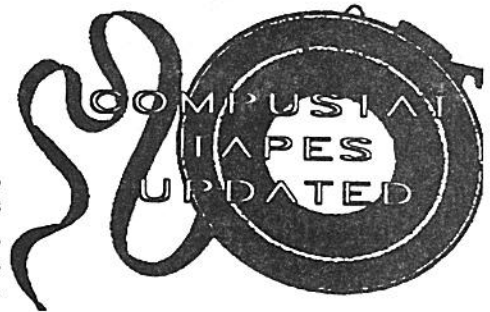
According to press reports, a Cornell graduate student wrote the virus, which was not actually harmful to computer systems. Due to an error in logic, his program multiplied hundreds of times faster than he wanted, causing processing to slow down on the affected machines. Incredibly slow processing time on the systems that had been "hit" was what first alerted people that something was amiss. At the time of this writing, the virus program has been analyzed completely and steps have been taken to "plug" the holes in the programs that "passed" the virus along.

Although the virus was essentially harmless, it is estimated to have cost about \$20 million in "man-hours" spent to clean-up the affected systems. John McAfee of the Computer Virus Association in San Francisco, California was interviewed on NBC'S TODAY. He provided the "man-hours" figure stated above and further stated that if the virus had destroyed data, the damages would have run into the billions of dollars.¹

The University of North Texas has two Unix machines connected to the Internet in the Computer Science Department. Action was taken by the Computer Science Department and the Computing Center to protect the machines from the virus. These actions included patching the network software, monitoring for virus symptoms, and disconnecting the machines from the network when the computer could not be monitored. Fortunately, these precautions were successful in protecting the machines.

The virus should have one beneficial effect. People will take regular backups and network security more seriously from now on. With the new focus on security, it will become nearly impossible for viruses to be written for Wide Area Networks.

¹From a BITNET VIRUS-L discussion by Kenneth van Wyk (Luken@LEHIIBM1)



By Phanit Laosirirat, Academic Computing Services Consultant (AC44@UNTMUSIC)

The CompuStat data tapes have been updated to include more recent data. If you are using data included in Bank CompuStat, Industrial CompuStat, and/or Research CompuStat, you need to change your JCL in order to access the new data. This is because the tapes have been written to disk using different member names, although they are still under the same library name. The following JCL is required to access these new data (the first two lines are MUSIC/SP commands).

Industrial CompuStat

```
/INCLUDE OSJE
RETURN
//IDnn JOB (IDnn,10,1),'your name',
// CLASS=A,PASSWORD=mvspw
// EXEC SAS
//COMPSTAT DD DISP=SHR,
// DSN=USER.AC44.COMSTAT,
// UNIT=SYSDA,
// VOL=SER=ACAD03
DATA INDUSTRY;
SET COMPSTAT.INDUSTRY;
```


Bank Compustat

```
//INCL 'DE OSJE
RETURN
//IDnn JOB (IDnn,10,1),'your name',
  CLASS=A,PASSWORD=mvspw
// EXEC SAS
//COMPSTAT DD DISP=SHR,
// DSN=USERAC44.COMSTAT,
// UNIT=SYSDA,
// VOL=SER=ACAD03
DATA BANK;
SET COMPSTAT.BANK;
```

Research Compustat

```
//INCLUDE OSJE
RETURN
//IDnn JOB (IDnn,10,1),'your name',
  CLASS=A,PASSWORD=mvspw
// EXEC SAS
//COMPSTAT DD DISP=SHR,
// DSN=USERAC44.COMSTAT,
// UNIT=SYSDA,
// VOL=SER=ACAD03
DATA RESEARCH;
SET COMPSTAT.RESEARCH;
```

If you have difficulty retrieving any of these data, please contact Academic Computing Services at 565-2324. ♦

Computing Center Employees Recognized for Service

Six employees of the Computing Center were honored for their years of service to the University on November 16 at the 12th annual Service Recognition Awards Ceremony. They are:

- Richard Harris, Associate Vice President for Computing -- 25 years.
- Coy Hoggard, Manager of Administrative Information Systems - 20 years.
- Earl Jackson, Admissions Team Leader -- 15 years.
- George Williams, General Systems Team Leader -- 15 years.
- Rachel Dowdy, Data Entry -- 10 years.
- Sue Harrison, Administrative Assistant -- 5 years. ♦

VS COBOL Installed on CMS

By Janis Burkham, Academic Computing Services Consultant (ACSS@UNIVM1)

OS/VS COBOL 2.4 has been installed under VM/CMS and provides for interactive job submission of COBOL programs. At the present time, it is available to faculty, staff, and graduate students who have CMS accounts (class instructional use of COBOL on CMS will be considered at a later date).

• To use COBOL on CMS:

1. Logon to your CMS Userid.
2. Enter: NTLINK COBOL
3. Enter: GLOBAL TXTLIB COBLIBVS

Note: There are no default libraries. If you wish to use the OS/VS COBOL 2.4 COMPILER AND LIBRARY during every terminal session, place the NTLINK COBOL command and the GLOBAL command in your PROFILE EXEC.

• To compile, load, and execute in the same step, enter:

RUN filename COBOL (options)

Where *filename* is the CMS file containing the COBOL program, which must have COBOL as the filetype, and *options* are the compiler options defined in the *IBM OS/VS COBOL Compiler and Library Programmer's Guide*.

• Compiling, Loading, and Executing in separate steps:

1. To compile a program enter:
COBOL filename
2. To load a program enter:
LOAD filename
3. To execute a program enter:
START

For serious users, the following manuals will prove to be helpful:

- *IBM VS COBOL for OS/VS.*
- *IBM OS/VS COBOL Compiler and Library Programmer's Guide*
- *IBM OS/VS COBOL Compiler and Library: General Information*
- *IBM OS COBOL Interactive Debug Terminal User's Guide and Reference*
- *IBM VS COBOL for OS/VS Reference Summary - Format, Status Key Values, Reserved Words.*
- *IBM CMS User's Guide for COBOL*
- *IBM Virtual Machine/370: CMS User's Guide*
- *IBM Virtual Machine/370: Terminal User's Guide*
- *IBM Virtual Machine/370: CMS Command and Macro Reference* ♦

Academic Computing Consultant Hired

Jim Stinson has been hired to fill the part-time position in Academic Computing Services vacated by Jim Aman (we call it the "Jim" position). Jim has a B.S in Computer Science and a B.A. in Physics from Texas A&M University. He is currently working on a Master's degree in Computer Science and plans to become an officer in the Navy Reserve in the near future. His ultimate goal is to gain employment as a software engineer, producing programs in the fields of numerical analysis, simulations of engineering processes or systems programming.

We are glad to have Jim working with us and know he will be able to provide valuable assistance to many people in his role as a consultant. ♦

Terminals Available

The Center for Studies in Aging has 7 Televideo 910 terminals they are not using. Call Les for details: 565-2765

New Utility to Search ICPSR Data Archive on MUSIC/SP

By Panu Sittiwong, Academic Computing Consultant
(AC09@UNTVM1)

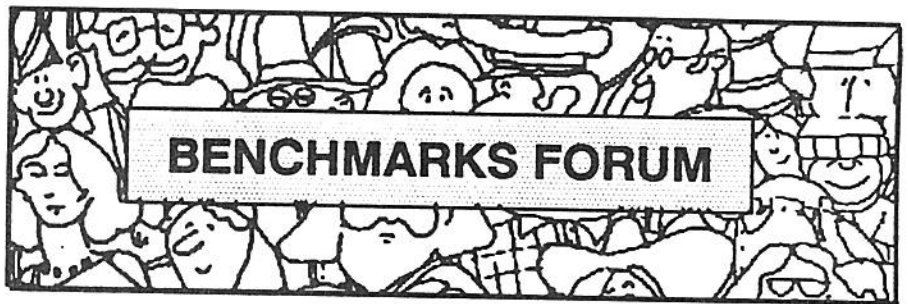
As a member of the Inter-university Consortium for Political and Social Research (ICPSR), UNT has in its archives hundreds of machine readable data on various topics and disciplines. These data are available to all UNT faculty, staff and students.

To facilitate a search of this database, the Computing Center has provided a new utility called FINDICPSR. It can be executed by typing FINDICPSR at the MUSIC *GO prompt.

Database searches can be done in two ways:

- First, a search based on the ICPSR study number. If you select this method and the particular study is currently available, you will be provided with the TMS tape information which you will need to use in your DD statement in order to access the data. If the dataset is not available, it can be ordered free of charge from ICPSR.
- Second, a search based on subject or title of a study. In this method, the program searches for all the titles of the studies which contain the text that you provided. If you find a study which might be of interest, you will need to follow the search with the first method, above, to check the availability of the dataset.

If you think you want to order a dataset, contact the Computing Center at 565-2324. It normally takes from two to four weeks for the data to arrive. ♦



BENCHMARKS FORUM is intended to serve as a vehicle for answering questions that may be of general interest to the user community. If you have a question, please send electronic mail to the *Benchmarks* editor (AS04@UNTVM1) or write it down and drop it by the Computing Center. We will try to answer it in the next issue.

Question: Sometimes when I call the dialup lines from home, the Sytek LAN displays the # prompt, but then when I type in commands, such as CALL, nothing happens. Is there anything I can do about this problem?

Answer: When this happens, try pressing the <Control><Q> keys. Often what happens is the last person on that port presses <Control><S>, which stops output from coming on the screen. If <Control><Q> does not fix the problem, you can hang up and then dial back the same dialup phone number again. Most of the time, you will get a different port since the ports are on a rotor. Also if <Control><Q> did not work, it would be helpful for you to report the problem to the Computing Center at (817) 565-2324.

Question: In Turbo Pascal 3.0 on the IBM PC, I was able to specify the compiler directive {\$U+} to use <Control><C> for stopping a program in an infinite loop. Under

Turbo Pascal 4.0, I can't find a way to stop a program in an infinite loop.

Answer: In Turbo Pascal 4.0, no equivalent of the {\$U+} directive exists. Turbo Pascal does allow you to stop a program with <Control><C> if the program is writing to the screen. However, if your infinite loop does not have statements that write to the screen, you have to reboot your computer. Of course, when you reboot, you will lose all work done since the last time you saved. Therefore, if you are doing any programming that might end up in an infinite loop, it is a good idea to always save before executing the program.

Question: How can I get a printed list of the files in my MUSIC save library?

Answer: A two-step procedure is necessary to accomplish this

- First, at the *GO prompt issue the following command:

LIB *S(filename)

This command will generate a list of all of the save library file names and save it in the file called *filename*.

- Second, once this file containing the names is generated, it can be printed in the usual manner using PTPCH. For more information, contact the HELP DESK at 565-4050 (ISB 110). ♦



Benchmarks Reader/User feedback is encouraged. Send all letters, suggestions, etc to (AS04@UNTVM1) or to the Benchmarks Editor at:

University of North Texas Computing
Center/NT Station, Box 13495
Denton, Texas 76203



MICROCOMPUTERS

What's NeXT? - The Computer Event That Has Everyone Talking

By Claudia Lynch, *Benchmarks*
Editor (AS04@UNIVM1)

Background

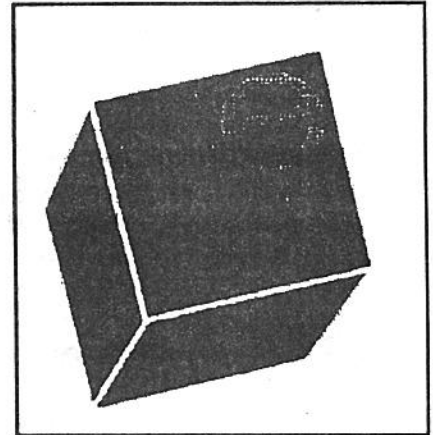
Steven Jobs, co-founder and former chairman of Apple Computer, Inc. has made many promises, and it looks like he's going to keep most of them. When Jobs left Apple three years ago he and several colleagues founded Next Inc. and vowed to build a "scholar's workstation." The workstation was "initially conceived as a 1 Million Instructions Per Second, one Megabyte, 1 Megapixel, networked, UNIX workstation that students could buy for \$3,000."¹ Along with this "dream machine" came the promise of a breakthrough in educational software development. Jobs raised investment capital from Carnegie Mellon, Stanford, and H. Ross Perot. Working closely with a higher education advisory board, it became obvious that '3-M' was really the minimum configuration. On Wednesday, October 12, in San Francisco's Symphony Hall, Jobs admitted that "... what the most aggressive researchers and educators want is a 'personal mainframe.'"² NeXT certainly seems to be a step in that direction!

A Little Black Box

The NeXT computer system consists of a foot-square magnesium cube containing the CPU and a laser-disk drive, a 17-inch high-resolution screen on an adjustable stand, a flat keyboard with white and green keys, and a two-button mouse. The cube is connected to the monitor by a 10-foot

cable.³ Major Features of the computer include:

- Two proprietary VLSI chips (Integrated Channel Processor and Optical Storage Processor) designed to provide "mainframe performance" for data transfer, allowing for multi-tasking.
- The Mach operating system, a version of UNIX developed at Carnegie Mellon University by Richard F. Rashid. It is supposed to be totally compatible with Berkeley UNIX 4.3.
- NextStep software environment, which controls how the screen looks and how the computer responds to commands. It includes Window Server, Workspace Manager, Application Kit, and Interface Builder.
- A read/write erasable optical-disk drive that uses removable 6-inch laser disks. According to Judith Axler Truner,⁴ the folks at NeXT say the 256-megabyte storage capacity of the disk allows a student to "put his whole universe in his backpack." The disks cost \$50 each and can hold the equivalent of between 300 to 400 books worth of information. It is also possible to add a 330MB or 660MB fixed-disk.
- Jacks for a microphone and a stereo-headphone. There is a built-in speaker and a 10-MIPS Motorola 56001 digital-signal-processing chip that turns sound into bits and bits into sound. The chip can also be used for FAX or



a communications modem. Special software is present that makes it easy to record speech, create music, and incorporate sound into text and data files.

- Eight megabytes of RAM and the option of buying 16 megabytes.
- Three available expansion slots that can hold up to 3 more CPU boards.
- A Motorola 68030 microprocessor running at 25MHz and a Motorola 68882 floating-point processor running at 25 MHz.
- A built-in Ethernet adapter.
- A fan with a variable-speed motor that allows it to slow down automatically when it is not needed. This reduces the noise of the fan.
- An optional \$2,000, 400 dot-per-inch PostScript-compatible laser printer that only works with NeXT.
- A set of reference works called the **Digital Library** that can be used through special searching and indexing software. Included in the library is *Webster's Ninth New Collegiate Dictionary*, complete with

pronunciation, etymology, and illustrations; *Webster's Collegiate Thesaurus*; *The Oxford Dictionary of Quotations*, and the Oxford University Press edition of *William Shakespeare: The Complete Works*. User manuals for the machine are also a part of the library.

- Data-management software from Sybase called **SQL Server** that organizes the information on the laser-disk so that any piece of information on the disk can be located in a matter of seconds.
- **Lip-Service**, an electronic-mail system that has the capacity for voice mail.
- A software library that includes Adobe Postscript, as both display

and printer driver; T/Maker Write Now word processor; Mathematica from Wolfram Research Inc.; and Franz Inc.'s Allegro

Common Lisp.⁵

But will it sell?

Next Inc. has established key partnerships with Motorola, Adobe, and Canon, and IBM will license the NextStep interface for its UNIX-based workstations. Frame Technology Corp., Cricket Software, Mark of the Unicorn Inc., and Farallon Computing have also endorsed NeXT and plan to begin developing applications for it. An additional 500 plus developers have indicated an interest in the machine. A notable absence is Microsoft Corporation. Bill Gates, chairman of Microsoft, said the small targeted audience [colleges and universities] of NeXT was responsible for the company's lack of interest.⁶

The audience may be small now, but as Peter Teige of Infocorp. predicted, "when the first generation students using the NeXT computer graduate, they will take their

machines with them into business."⁷ As it stands now, NeXT is in its "beta test" phase. Princeton University has committed to purchase approximately 50 of the NeXT machines for the 1988-89 academic year.

The future of NeXT as a strictly academic machine seems destined to be brief. H. Ross Perot, who owns 16 percent of NeXT (bought for \$20 million 18 months ago), states "A computer that does a world-class job in education will do a world-class job in anything. A computer is a universal tool."⁸ Not to mention the fact that there's a lot more money to be made in industry. . .

Ester Dyson, Editor of *Release 1.0*, states "The technology is wonderful,

but the deal with IBM is the smartest part. The NeXT machine will get applications because of IBM, and IBM will lead the way right into the business market."⁹ She just may have hit the nail on the head.

The technology is wonderful, but the deal with IBM is the smartest part.

*Ester Dyson*¹⁰

Footnotes

¹ Updegrave, Dan, "NeXT: The Computer System and the Event," *CCNEWS - An Electronic Forum for Campus Computing Newsletter Editors*, Volume 1, No. 25, October 16, 1988. (UPDEGROV@EDUCOM)

² Ibid.

³ Described by Judith Axler Turner in "Jobs Unveils Long-Awaited NeXT Computer, Says He Will Sell It Only to Colleges," *The Chronicle of Higher Education*, October 19, 1988 (pp. A-17 - A-21).

⁴ Ibid.

⁵ As described in INFOWORLD. "Job's Next Machine Wins Praise, Poses Questions," October 17, 1988, Volume 10, Issue 42 (pp 51, 93)

^{6,7} Ibid.

^{8,10} *The Chronicle of Higher Education*, October 19, 1988 (p. A21). ♦

NeXT, A Personal Perspective

By Jon Pugh, National Magnetic Fusion Energy Computer Center, Lawrence Livermore National Laboratory (PUGH@NMFECCARPA)*

I just got back from the NeXT introduction and thought I should report on the facts that were revealed to the world today. I must say first that while the NeXT machine is new and exciting, I don't think it is revolutionary. It is merely doing the things that people have thought should be done (at least the people I talk to). It is hot. It is fast. It is easy to program.

A description of the show is in order. We lined up outside as people presented their picture ids and were cross checked on the guest list. The symphony hall in SF is a very posh place and I ended up in a balcony box right above the stage. Perfect seating. Watching the audience was a who's who of the computer biz pastime. I saw H. Ross Perot, Hiedi Rozen, John Dvorak, The Woz, Andy Hertzfeld, Chuck Farnham, and many others. When the lights dimmed, Steve Jobs came out and began by saying, "It's been a long time." He got a standing ovation at the end.

He first went through a description of a machine's lifetime in terms of its level of innovation. Machines have a 10 year life cycle and the Apple II is a prime example of how a machine peaks innovatively about 5 years after it is introduced and then the only changes are hardware tweaks to make it perform better. The reason for the decline in innovation after 5 years is that the machine's strongest point becomes its greatest liability. It's hardware locks it into a decline. Changing the hardware is impossible because of the base of applications that have been written for the existing hardware. Whereas, when it was new it's hardware made it the choice platform for new applications. The IBM

PC and Macintosh were also depicted on their own 10 year innovation curves. The interesting thing to note about the IBM PC and Mac curves was that they are crossing right now. The IBM PC peaked in 1986 according to Jobs, and that means that the new innovative software packages are being written for the Macintosh first. I think we would all agree that this is true. Steve is betting that the NeXT machine will be the next wave of innovation. He placed this peak in 1994, 5 years after now (well, after he starts shipping for real next year).

A tour of the hardware and a movie of the Fremont production facilities was then shown. For brevity's sake I will just outline the minimum configuration. Remember the Jobs principle, you make progress by raising the lowest common denominator. The machine has no real options, but it is expandable. A 25 MHz 68030 with a 68882 FPU and the 56001 DSP (a 10 MIPS Digital Signal Processor), all from Motorola. It comes with 8 Meg of RAM expan-

dable to 16 Meg. That's 1 Meg SIMMs. They suspect that it should work with 4 Meg SIMMs, but they haven't been able to find any to try with. The connectors include a 2 Mac DIN8 serial ports, a DB9 printer port, a Mac pin compatible SCSI port (operating at a much higher speed), a thin cable ethernet port, and a port for hooking directly up to the DSP (just in case). They include a backplane for future expansion which is a 25 MHz Nubus wherein all the protocols are controlled by a single ROM which will be available to developers for \$25. All this seems to be really incredible, but it doesn't address the single most important issue that NeXT has addressed. Memory is the bottleneck for this whole machine. All the peripheral processors cannot do squat if they are waiting for memory, so the NeXT crew looked at mainframes for the solution, and implemented 12 DMA IO

channels in 2 large VLSI chips. These "mainframe in a chips" allow the NeXT machine to haul ass. They also implement a large portion of their storage controllers in these chips.

The storage itself is everything it was rumored to be. 256 Meg of read, write, erasable magneto-optical storage. That's it. It has about a 60 mSec access time, but a transfer rate of over 1 Mbit per sec. Let me tell you, the access time is not that noticable, especially when you consider that it's all DMA access while the CPU can be doing something else (i.e. full multitasking, remember?). Their press kits included a demo disk which is supposed to cost only \$50. So much for the removable disks. There is room in the machine for two

onto it for ergonomic control. The whole thing is attached by a 3 meter cable to the cube. The cube is switchable to any power source. Find a cable with the right plug and it will adjust to the power supply.

The printer is a 400 dpi bit blaster. No Postscript on board since it is in the cube. It is a straight path feeder and it has a single feeder tray that can adjust to any size paper (well, smaller than 8 1/2 x 11).

The software is also impressive. They use Mach, a Berkeley 4.3 compatible Unix done better, with the NFS file system. On this they place DisplayPostscript and their own windowing system (none of the others would do enough of what they wanted). On this they placed an Ap-

When asked how people not associated with a university could get a machine, Steve replied, "Enroll."

plication Toolkit of 20 objects and created Interface Builder, a ResEdit-like tool for adding an interface to your Application objects graphically. It very closely resembles the Smalltalk Browser, I am told. On top of this will sit the applications. These object oriented layers are what Jobs sold to

full height drives and NeXT will be offering both 330 M and 660 M Winchester as optional hardware.

The monitor is a megapixel display in 2 bit b&w. They thought that a big display was more important than color and they also know the Hollywood motto, "Always leave them wanting more." The monitor is 1120 x 832 at 92 dpi. Very pretty. It has only one wire to the NeXT box (which is a black cube, but you knew that) and no plug. The only switches are on the keyboard which plugs into the monitor. It has two gold plated RCA jacks for sound output and a stereo walkman plug for private listening. It also has a microphone input to an 8 KHz digitizer for speech input. There's gonna be some shaking and moving with this puppy! The mouse is a two button job, but apparently only one button is used for most operations. We'll see how that goes. The monitor has a stand built

IBM and what will be called Next-Step. IBM will apparently be using it on their RISC machine and it will be application (source code) compatible with the NeXT machine.

It is all written with the GNU C compiler and Objective C 4.0. Both of these come with the machine as does Unix. Also bundled is the GDB debugger, Franz Allegro Common Lisp, Mathematica, and Sybase's SQL Server. NeXT also includes some of their software; WriteNow, Searcher, their index program, Interface Builder, and Workspace Manager, their Finder. Also included is Webster's 9th Collegiate (which I would have spelled right if I'd had one) Dictionary, complete with illustrations, their Thesaurus, The Oxford Book of Quotes, and the Complete Works of William Shakespeare. Search for any word any of them. Fast too! It also has ALL the reference manuals on line.

Serious stuff for serious tech-junkies!

Now get this, \$6500 for the cube and monitor. \$2000 for the printer. Then they are charging \$2000 for the 330 Mb drive and \$4000 for the 660 Mb drive.

That's the university price and ONLY university people can buy them. They will be shipping 0.8 to beta sites this month, 0.9 to beta sites and aggressive users end of first quarter 89, and 1.0 to regular people end of the second quarter. When asked how people not associated with a university could get a machine, Steve replied, "Enroll." There's a reason to go back to school... ♦

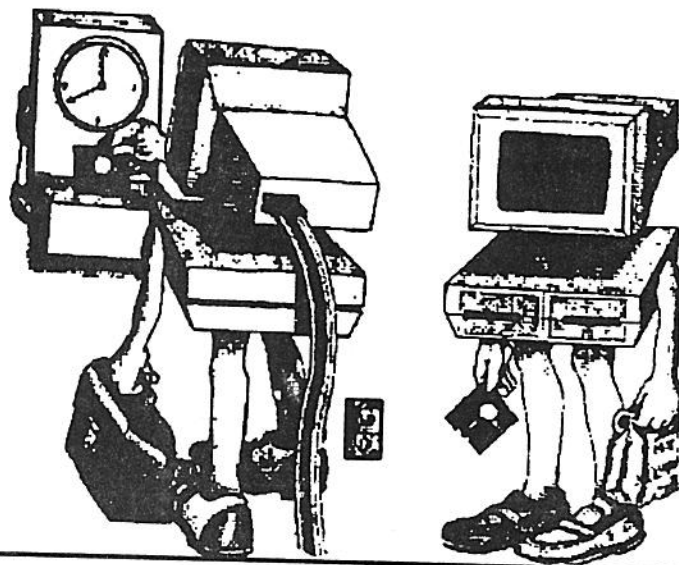
Reprinted, with the author's permission, from "NeXT Introduction," INFO-MAC Digest (INFO-MAC@RICE) Friday, 14 Oct. 1988, Volume 6: Issue 96

Altruistic Computing

According to an article in the November issue of *Information Center* (Vol. IV No.11, p. 8), the Nynex Foundation recently donated \$10,000 to the Society for Public access Computing (SoPAC). The money is to aid in the development of a new version of *Free-Net*, which is supposed to be the first community computer system in the United States to offer information services free of charge to the public.

Free-Net is currently in operation in the Ohio cities of Cleveland and Youngstown, where it is available to anyone who has a PC and a modem. The network, according to the *Information Center* article, is essentially an on-line public library. It's services include electronic mail; interactive communications with elected government officials; an "electronic school-house" for students and teachers; and medical, dental, and legal information.

SoPAC incorporated as a non-profit information service in 1987. Plans are currently underway to expand the *Free-Net* services to the northeast. ♦



Micro-Tips

This column is intended to serve as a forum for sharing useful tips on making more productive use of microcomputers. If you have a tip that you feel may be of use to campus users, submit it to the BENCHMARKS editor for possible inclusion in a future issue.

Using Xcopy to Copy Entire Directory Structures

If you use a version of PC or MS-DOS equal to or greater than 3.2, you can use the XCopy command to copy entire directory structures at the same time. The reasons you would want to do this range from wanting to easily make a copy of a floppy diskette that has subdirectories on it, to duplicating an entire hard disk.

The appropriate command for copying a directory structure along with its files from one place to another is:

XCOPY source dest /S /E /V

Where:

XCopy is the actual name of the program that does the copying. It is one of the utilities that is included with DOS. In order to use it, it must be located in the current directory or path.

source should be a valid description of the place you want to copy from in the form d:path where d: is a valid drive name and path is a valid directory path. If, for instance, you're copying out of the root directory of drive C:, the appropriate source would be C:\ not C:.

dest should be a valid description of the place you want to copy to in the same form as the description above for the source.

/S, /E and /V are all examples of something called command line options.

The /S option tells Xcopy to copy all the constituent subdirectories from the source to the destination. The /E option tells Xcopy to include any empty subdirectories in its copy from the source. Finally, the /V option tells Xcopy to verify the accuracy of each write to the destination.

An example would be:

Xcopy A:\ C:\FROM_A\ /S /E /V

For information about additional ways to use Xcopy or any other DOS commands, consult the owner's

manual for your copy of MS-DOS or PC-DOS, or call Academic Computing Services at 565-2324.

Ejecting Disks from a Macintosh

Many programs that you might use on an Apple Macintosh do not provide for easy removal of disks from your computer without either leaving the program or traversing an extensive set of menus.

If you would like to eject a disk without leaving a program, simply hold the <SHIFT> and <OPTION> keys down while you press either the <1> or <2> key, depending on which drive contains the disk you want to eject. If, for instance, you want to eject a disk from your first disk drive, press <SHIFT> <1>. Similarly, if you want to eject a disk from your second disk drive, press <SHIFT> <2>.

It should be noted that this command simply ejects the disks from your computer and places them "off line". Once the disks are out of your disk drive, the disk icon on your desktop and any other icons associated with that disk will appear shaded. This means that your Macintosh still knows what is on this disk, and will ask you to insert it again if you should need to use it. If, after ejecting the disk, you know that you won't need to use it for a time, you can drag the shaded disk icon to the trashcan and "un-mount" your disk.

For further information about using micro-floppy disks with Macintosh computers, call Academic Computing Services at 565-2324, and/or browse through Apple's *Technical Introduction to the Macintosh Family*, and Macintosh SE (or other model) user's manual.

Sharing Files With Others On a Novell LAN

One of the attractive things about a local area network is that it allows several users to share disk files stored at a central location. This sharing,

however, isn't automatic. You can set it up yourself, from your PC.

Sharing files with others could mean two things. If the file is one you would want to access primarily just to read, you might want several people to be able to read it at the same time. If you access this file both to write to it and read from it, you might want to let several people access the file, but only one at a time.

On a Novell local area network, the appropriate way to give users access to a file or group of files is to create a subdirectory that those people can access on the network drive and define rights for those individuals within that subdirectory.

Assuming that you've already created a subdirectory, you can grant rights to people using your LAN with the following command:

GRANT rightslist FOR path TO user_or_group_name

An example of this would be:

Grant Read for f:\home\bigboss\memos to everyone

In the example, you would give everyone (or rather, the formal group **EVERYONE**, of which all users are members) the privilege of being able to read any file that you place in the \HOME\BIGBOSS\MEMOS subdirectory on the network disk drive F:.

Likewise, if you later wanted to revoke those rights from any particular users or group of users, you could use Novell's **REVOKE** command with similar syntax.

If you want to let several people access files in a subdirectory at one time, you could use the Novell **FLAG** command. The usage would be like this:

FLAG file_name SHAREABLE

For instance, if all the files in the above-mentioned memos subdirectory with a TXT extension were files that you wanted all your co-workers to be able to read, regardless of

whether or not someone else was reading them also, you could make them shareable by giving the command:

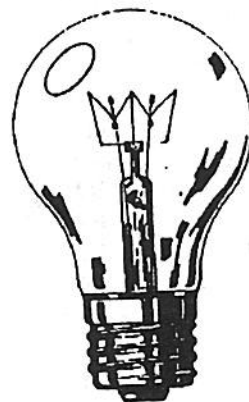
FLAG F:\Home\BigBoss\Memos*.TXT SHAREABLE

Each of the files to which your *.txt specification applied could be simultaneously read by each of users on your local area network.

If you would like more information about sharing files, LAN usage and security, or about how you could improve your computing environment with a local area network, call Office Automation or Academic Computing Services at 565-2324. ♦

This month's MICROTIPS have been provided by Kevin Mullet, Academic Computing Services Consultant (ACS2@UNTVAX)

Another Light Bulb Joke . . .



Q: How many surrealists does it take to change a light bulb?

A: Fish

From Kent Cearley, University of Colorado Management Systems (CEARLEY_K@COLORADO.BITNET)

VAX COMPUTER CLUSTER

Using FTP to Transfer Files From ARPANET to the VAXcluster

By Sean Wheeler, VAX Operator
(SEAN@UNT.VAX)

FTP (File Transfer Protocol) is used to access ARPA Internet hosts to transfer files between the VAXcluster and the remote host. This version of FTP is part of a complete TCP package by The Wollongong Group and provides several improvements over the previous public domain VFTP. FTP can also be used to transfer files to and from the Research Vax and the NBI.

In this article, I will illustrate the use of FTP to transfer files to the NBI here on our campus. The procedure for transferring to ARPA Internet hosts is identical.

The first step to establishing an FTP connection is getting the right address of the machine you want to connect to. There is a list of KNOWN FTP sites in the file:

DUA1:[PUBLIC.NETWORKS.ARPANET]
FTP.LIST

The local academic machines available via FTP are:

- NBL.CSCL.UNT.EDU (for the NBI)
- DEPT.CSCL.UNT.EDU (for the Research Vax)
- VAXA.ACS.UNT.EDU (for Vax A)
- VAXB.ACS.UNT.EDU (for Vax B)

To open a connection type:

FTP NBL.CSCL.UNT.EDU

You will see a screen resembling the following:

```
vaxa.acs.unt.edu Wollongong FTP User
Process (Version 3.2)
Connection Opened
Using 8-bit bytes.
FTP server (Version 4.112 Thu Oct 30
09:11:04 PST 1986) ready.
Name (nbi.csci.unt.edu:sean):
```

At this point FTP is requesting the account name for log-in on the NBI, after which it will prompt you for the password, log you in and give you an asterisk (*) prompt. When connecting with a UNIX system be sure to type the username and password in all lowercase characters.

To see a list of files in your NBI account type DIR, FTP will respond with something like this:

```
<PORT command okay.
<Opening data connection for /bin/ls
(129.120.1.3,1826) (0 bytes).
<Transfer complete.
total 51
-rwx----- 1 sean 285 445 Sep 8 18:25 .cshrc
-rwx----- 1 sean 285 175 Nov 19 1987 .login
-rw----- 1 sean 285 6 Nov 19 1987 .logout
-rw-rw---- 1 sean 285 49 Sep 7 15:55 .plan
-rw-rw---- 1 sean 285 346 Sep 22 17:37 a1.c
-rwxrwx--- 1 sean 285 955 Dec 9 1987 erase
-rwxrwx--- 1 sean 285 23196 Sep 22 15:49 p1
-rw-rw---- 1 sean 285 648 Sep 22 17:39 p1.txt
drwxrwx-- 2 sean 285 512 Sep 8 00:26 stuff
drwxrwx-- 2 sean 285 512 Sep 9 15:37 apple
984 bytes in 1 seconds--7872 bps
```

The LS command will also list the files but only by name not with the size, protection or other information. To change directories on the remote host use the CD command as in the following example:

*CD APPLE

<CWD command okay

*DIR

command okay. g data connection for /bin/ls (129.120.1.3,1832) (0 bytes).

<Transfer complete.

total 139

-rw----- 1 sean 285 253 Aug 21 01:50 ap-
pmak.unx

-rw-rw---- 1 sean 285 22650 Aug 21 01:26
aprxas.1

-rw-rw---- 1 sean 285 20135 Aug 21 01:27
aprxas.2

-rw-rw---- 1 sean 285 24958 Aug 21 01:27
aprxas.3

-rw-rw---- 1 sean 285 3907 Aug 21 01:44
as6502.1

-rw-rw---- 1 sean 285 1263 Aug 21 01:44
asam.d1

-rw-rw---- 1 sean 285 1391 Aug 21 01:44
asam.d2

-rw-rw---- 1 sean 285 7219 Aug 21 01:44
asam0.c

-rw-rw---- 1 sean 285 5353 Aug 21 01:44
asam1.c

-rw-rw---- 1 sean 285 8590 Aug 21 01:45
asam2.c

-rw-rw---- 1 sean 285 15754 Aug 21 01:45
asam3.c

-rw-rw---- 1 sean 285 4113 Aug 21 01:44
asamtst

-rw-rw---- 1 sean 285 12951 Aug 21 01:44
asamtst.1

-rw-rw---- 1 sean 285 614 Aug 21 01:44
makefile

-rw-rw---- 1 sean 285 4082 Aug 21 01:44
user.nr

952 bytes in 1 seconds--51608 bps

*CD ..

The CD .. command takes you back up one directory.

At this point, let's say you want to get a file from the NBI named NEC.TXT. You would type GET NEC.TXT. You would see something like:


```
< Port command okay.
Opening data connection for nec.txt
(129.120.1.3,1828) (6579 bytes).
< Transfer complete.
6451 bytes in 1 seconds--51608 bps
```

To see if the file got to your VAX account, you will need to do a directory on the VAXcluster. Type **VMS DIR** and a directory listing similar to the following will appear.

```
Directory $1$DUA0:[SEAN]
BENCHMARKS.DIR;1
C.DIR;1
COM.DIR;1
DCL.DIR;1
FTP.DIR;1
HELP.DIR;1
LOGS.DIR;1
MAIL.DIR;1
NEC.TXT;1
PAS.DIR;1
TEMP.DIR;1
TEXT.DIR;1
TPU.DIR;1
Total of 13 files.
```

Lets say I now want to send a file from the VAX to the NBI and the file is in my TEXT directory. First I need to change to that directory and then I need to send the file. To change directories, for example:

```
•LCD [.TEXT]
Local directory changed to
$1$DUA0:[SEAN.TEXT]
•VMS DIR
Directory $1$DUA0:[SEAN.TEXT]
9TH.TXT;1
BILLCAT.TXT;1
CATPOSTER.TXT;1
ELEPHANT.TXT;1
GLAB.TXT;3
PHLIS;9
SCHEDULE.TXT;1
STARTREK.TXT;1
Total of 8 files.
```

To send the file:

```
•PUT PHLIS
<PORT command okay.
<Opening data connection for ph.lis
(129.120.1.3,1830).
4551 bytes in 1 seconds--36408 bps
<Transfer complete.
•LS
<PORT command okay.
<Opening data connection for /bin/ls
(129.120.1.3,1831) (0 bytes).
<Transfer complete.
.cshrc
.login
.logout
.plan
.a1.c
.apple
.erase
.pl
.pl.txt
.ph.lis
.stuff
118 bytes in 1 seconds--944 bps
```

Notice that you can see the new file **PHLIS** on the NBI directory.

When you are through, type **CLOSE** The NBI will respond:

```
Goodbye.
-- Connection has Terminated --
```

Type **EXIT** and you are back at the **VMS** prompt and ready to go. Other commands of interest are:

- **BINARY** -- this allows you send and receive binary files and is equivalent to **VFTP**'s **TYPE L 8** command.
- **ASCII** -- this resets the transfer mode back to **ascii** so that you can do directory commands.
- **TENEX** -- this allows you transfer files in **tenex** format which is equivalent to **VFTP**'s **TYPE L 32** command. This is usually the format to use for binary files at **SIMTEL20.ARPA**.
- **OPEN hostname** -- this allows you to establish a connect to a host if you don't specify one when you run **FTP** or after you have done a **CLOSE** command.
- **VMS command** -- as you saw above this lets you do local commands on the VAX.

For more information on **FTP**, while on the VAX, type **HELP FTP**. The files in the directory **DUA1:[PUBLIC.NETWORKS.ARPA]** also contain information. Many sites have the user **ANONYMOUS** set up with the password **GUEST** for anybody to use. ♦

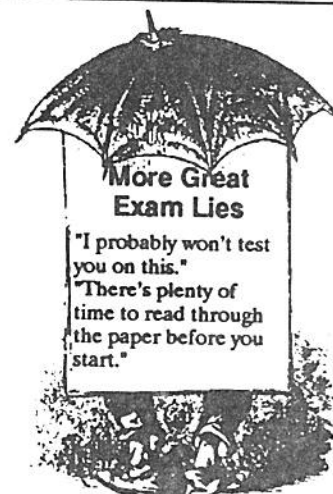
VAX CLUSTER USAGE STATISTICS

September Top Ten Programs: Frequency of Runs

Program	Description	Number of Runs	Percent of Total
1. SET	VMS Utility	76335	13.9
2. LOGINOUT	User login	73106	13.3
3. DIRECTORY	VMS Utility	55561	10.1
4. DELETE	VMS Utility	50570	9.2
5. TYPE	VMS Utility	39010	7.1
6. SHOW	VMS Utility	32404	5.9
7. SEARCH	VMS Utility	29344	4.2
8. EDT	Editor	23158	3.9
9. NETSERVER	DECnet Server	21447	5.3
10. User Programs	Compiled Programs	14293	2.6
Total		549599	

September Top Ten Programs: CPU Time Used

Program	Description	CPU Time	Percent of Total
1. User programs	Compiled Programs	42 21:55:38.92	81.3
2. ACC	VMS Accounting Utility	1 09:45:53.78	2.7
3. EDT	Editor	0 20:59:40.71	1.7
4. MAXCLAS	ERDAS Utility	0 18:49:24.54	1.5
5. BACKUP	VMS Utility	0 15:12:23.10	1.2
6. PASCAL	PASCAL compiler	0 13:22:05.48	1.1
7. LOGINOUT	User login	0 10:17:41.87	0.8
8. BBS	Bulletin Board Utility	0 09:18:29.05	0.7
9. LISP	LISP Interpreter	0 07:18:34.01	0.6
10. DISKEEPER	Disk Compression Utility	0 06:51:45.61	0.5
Total		52 18:10:02.29	



COMPUTER SERVICES

Mainframe Performance Statistics

NAS/8083 Dual Processor Performance Statistics for September

CPU	SYSTEM	Scheduled Operating Hours	Planned Maintenance Hours	Planned Production Hours	Unplanned Maintenance Hours	Production Hours Achieved	System Uptime
ACAD	VM/SP3	720	0.00	720.00	0.10	719.90	99.9%
ACAD	MUSIC/SP	720	29.58	690.42	0.65	689.77	99.9%
ACAD	MVS/JES2	720	0.00	720.00	0.70	719.30	99.9%
ACAD	COMPLETA	720	0.00	720.00	4.53	715.47	99.4%
ADMN	MVS/JES2	720	2.06	717.94	3.73	714.21	99.5%
ADMN	COMPLETA	269	0.00	269.00	3.71	265.29	98.6%
ADMN	ADABASA	720	23.54	696.46	5.15	691.31	99.3%

System Uptime = (Production Hours Achieved) / (Planned Production Hours)
 Production Hours Achieved = (Planned Production) - (Unplanned Maintenance)
 Scheduled Operating Hours = (Planned Maintenance) + (Planned Production)
 MUSIC/SP Planned Maintenance Hours include 18.55 hours for system backup and 11.03 hours for VM/SP3 system backup.
 ADABASA'S Planned Maintenance Hours include 21.36 hours for system backup.
 The ACAD CPU achieved 100% uptime; the NAS/7360 DASD achieved 100% uptime; the NAS/7380 DASD achieved 100% uptime. The ADMN CPU achieved 99.4% uptime; the NAS/7360 DASD achieved 100% uptime; the NAS/7380 DASD achieved 100% uptime.

Lost productivity is calculated as the greatest amount of elapsed time that any one of the production systems was unavailable for

scheduled operation. Lost productivity hours were contributed to by the key causes appearing in the table below.

ACAD CPU:

Miscellaneous

1. COMPLETA system failures.	0.62 HOURS
2. VM/SP3 system tuning/improvements	0.63
3. COMPLETA system tuning/improvements	1.46
4. COMPLETA system maintenance..	2.65
GRAND TOTAL FOR ACAD	5.36 HOURS

ADMN CPU:

CPU, Tape, and Disk Subsystems (NAS)

1. Installation of additional 7380 DASD.	2.18 HOURS
TOTAL:	2.18 HOURS

COMTEN 3690 TCU (NCR)

1. Corrective maintenance.	3.10 HOURS
TOTAL:	3.10 HOURS

Miscellaneous

1. COMPLETA system tuning/improvements.	1.06 HOURS
2. COMP > ETA down to run single jobs.	1.83
3. Undetermined causes for systems restarts.	2.05
TOTAL:	4.94 HOURS
GRAND TOTAL FOR ADMN:	10.22 HOURS

DISK BACKUP SCHEDULES

OS/MVS Backup Schedule

OS/MVS disk packs (academic and administrative) are backed up daily, Tuesday through Saturday, from 4-6:30 a.m., and Sunday from Midnight to 3 a.m. A backup of all the operating systems on the NAS CPU and their contents is done once every two weeks at some low activity period over a weekend.

MUSIC/SP Backup Hours

A message will be sent to all users signed on to MUSIC/SP approximately 10 minutes before backups are begun. It will be in the form **MUSIC SHUT DOWN AT xxxx AM-SCHEDULED BACKUP **. To find out the backup hours while signed on to MUSIC/SP, enter **HELP HOURS**.

The following backup schedule is currently in effect:

- Tuesday 3 a.m. (for about 3 hours)
Weekly backup
- Wednesday 3 a.m. (for about 2 hours)
Daily backup
- Thursday-Monday 4 a.m. (for about 1 hour)
Daily backup

PHOENIX Backup Hours

PHOENIX is backed up weekly on Sunday night. The backup begins at midnight and lasts for approximately 30 minutes.

VAX Backup Schedule

Incremental backups of the VAXcluster are performed Monday through Thursday at 6 p.m. Users do not have to log-off, but any files that are open at the time of the backup will NOT be backed up.

Full backups of both systems are done every Friday beginning at 8 a.m. These generally will take all day to complete. Again, users do not have to log-off, but any files that are open will not be backed up.

A "Stand Alone" backup of the system disk is done once a month. This procedure makes a copy of the system disk that can be used to restore its contents if the disk is completely destroyed. The system will be shut-down for this. Watch the system log-on message for specific times and dates.

NOTE: Requests for restoration of files should be made via MAIL to the username OPERATOR. Your file can only be restored if it existed before the last backup was done. ♦

ACADemic (NAS) Program Hit Parade

September Top Ten Programs : Frequency Of Runs

Program	Description	Number of Runs	Percent of Total
1. IEWL	Linkage Editor	5425	14.3
2. PTPCH	Dataset Lister	5345	14.1
3. PGM = *.DD	Compiled Program	5340	14.1
4. IKFCBL00	VS COBOL Compiler	4013	10.6
5. SASLPA	SAS	3526	9.3
6. IEBGENER	IBM Utility	2446	6.4
7. IKJEFT01	Password Change	2153	5.7
8. SCRIPT	Waterloo/SCRIPT	1658	4.4
9. SPSSX	SPSS ⁺	1617	4.3
10. IEV90	Assembler H	1306	3.4

September Top Ten Programs: CPU Seconds Used

Program	Description	CPU Seconds	Percent of Total
1. SASLPA	SAS	59699	46.3
2. PGM = *.DD	Compiled Program	16761	13.0
3. COMPLETX	Academic COM-LETE	11017	8.5
4. SPSSX	SPSSX	7951	6.2
5. FATS	Tape Verification Program	4887	3.8
6. IKFCBL00	VS COBOL Compiler	4085	3.2
7. PTPCH	Dataset Lister	4055	3.1
8. MAIN	FORTTRAN Programs	3545	2.7
9. SCRIPT	Waterloo/SCRIPT	3539	2.7
7. ISTINM01	VTAM Utility	2143	1.7

The programs listed in this section were used the most frequently on the NAS CPU during the month of September, 1988.

Please Note that ACAD is the official designation of the part of the NAS/8083 CPU that is dedicated to faculty and student use. The portion of the computer reserved for University administrative purposes is termed ADMN. ♦



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